

Continuous erector spinae plane block as part of opioid-sparing postoperative analgesia after video-assisted thoracic surgeries: Series of 4 cases

INTRODUCTION

Acute postoperative pain management for patients undergoing thoracic surgery has always been on a lever between good pain coverage and major opioid side effects. As nonopioid drugs do not suffice to cover the pain after thoracic surgery and the epidural catheter seems to be losing its supremacy due to its severe possible complications,^[1] the erector spinae (ES) plane block opts as a promising new method in multimodal analgesia. A continuous ES plane block administered for postoperative analgesia following video-assisted thoracic surgery (VATS) with minimal thoracotomy surgical approach has not been described thus far.

CASE REPORTS

We performed the blocks in awake state in prone position prior to surgery under ultrasound guidance at the T4 level. We moved the probe ~3 cm ipsilaterally to the operated side and found the transverse process by moving the probe sideways. The transverse process

was noted by the oval shape of the rib changing into the rectangular shape of the process. We inserted an 18G hypodermic needle under aseptic conditions craniocaudally in-plane after subcutaneous injection of 2 ml lidocaine 2%. When the needle tip was correctly positioned, just above the vertebral lamina, we dissected the overlying ES muscle with 10mL of 0.9% NaCl. We inserted a perineural catheter and confirmed its position with ultrasound [Figure 1].

We induced anesthesia with a bolus of remifentanyl 1 µg/kg, propofol 2 mg/kg and rocuronium 0.7 mg/kg. Total intravenous anesthesia proceeded with remifentanyl and propofol with intermittent boluses of rocuronium. 20 min prior to end of the surgery we injected a bolus of 20 ml 0.5% levobupivacaine. Continuous infusion 5ml/h of 0.2% ropivacaine with boluses of 15 ml every 4 h was set using a programmable pump. Total consumption of local anesthetic ropivacaine 0.2% varied from 175ml to 367.5ml, depending on time to catheter removal. Multimodal analgesia included metamizole 2.5g/12h intravenously on the first day and 500 mg/8h orally on the second day, diclofenac 100mg orally on the second day and paracetamol 1000 mg/8h intravenously if needed. The patients assessed the pain subjectively according to the Visual Analogue Scale (VAS) from 0 being no pain and 10 being the worst pain imaginable [Figure 2]. When the pain was higher than 3/10, the nurse applied a bolus of 3-5mg piritramide. We obtained an approval of the Slovenian National Committee for Medical Ethics number 0120-372/2019/7.

Case 1

A 74-year-old man with carcinoma of the left superior lobe of the lung, hypertension, post cerebro-vascular insult, with right hemiblock and prostate enlargement, presented for VATS lobectomy. In the time after surgery he did not use any rescue analgesia. He marked pain scores up to 3/10 in the first 3 h after surgery in resting position. The pain fell to 0 in resting with increases solely during respiratory physiotherapy. We removed the catheter prior to 48 h postoperatively.

Case 2

A 71-year-old man with a tumor of the right inferior pulmonary lobe, hypertension and candidiasis of the esophagus, presented for VATS marginal resection of the right inferior lobe of the lung. He marked pain scores up to 3 postoperatively and only received one rescue bolus of 3mg piritramide. We removed the catheter after 20 h, when he was transferred to another department.

Case 3

A 66-year-old woman with adenocarcinoma of the right upper lobe of the lung, hypertension, moderate aortic stenosis with diastolic dysfunction of the left ventricle, chronic gastritis, diaphragmatic hernia, osteoporosis, uric arthritis, and sideropenic anemia presented for VATS lobectomy. The patient reported pain immediately after waking up from anesthesia. We administered a rescue bolus of 4 mg piritramide, after which the pain settled down. After 6 h she did not report any pain at rest, and after 12 h she did not report any pain at activity. We removed the catheter after her pain scores were negative for 21 consecutive h.

Case 4

A 79-year-old woman with myasthenia gravis with thymoma, hypertension, diabetes mellitus 2, diverticulosis, fecal incontinence, on glucocorticoid drugs, presented for VATS thymoma resection. She did not require any piritramide therapy; her pain scale was 0 at rest with only one exception scaling 1 on the first postoperative day (POD). We removed the catheter on the second POD.

DISCUSSION

The ES plane block is a recently advanced method of regional anesthesia, where the local anesthetic is injected deep into the fascial plane between the erector spinae muscle and the lamina of thoracic vertebrae.

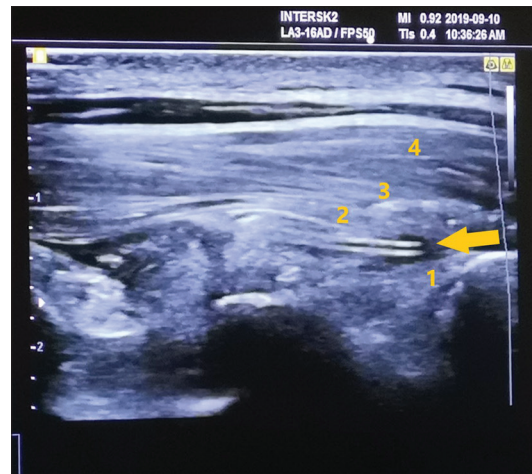


Figure 1: Ultrasound confirmation of the ES catheter positioning. We can see the catheter coming in from the right side of the picture (arrow), lying above the hypoechoic transverse process. The injected physiological solution dissects the ES muscle from the underlying thoracic vertebral lamina. 1 - thoracic vertebral lamina, 2 - m. erector spinae, 3 - m. romboideus major, 4 - m. trapezius

The local anesthetic spreads in craniocaudal fashion over several levels of the spine.^[2]

The use of a single shot ES block has been described for surgeries in different areas of the body, such as breast surgery^[3,4] or even total hip arthroplasty.^[5] Its use after VATS procedures was described in case reports^[6] and proven useful in a prospective, randomised study from 2019.^[7] To lengthen the duration of regional anesthesia, a block can be administered continually with the help of a catheter. However, the use of an ES catheter for prolonged analgesia in other fields of surgery was only described in case reports.^[8]

In our experience, the use of ES continuous block brought a dramatic decrease of opioid analgesics consumption. Before regional anesthesia, patients in our department going through VATS procedures, received continuous intravenous infusions of 1-3 mg/h piritramide for 36-42 hours postoperatively. With the ES continuous block, our patients did not receive a continuous infusion of opioid analgesics and required at most one bolus of 3-4 mg of piritramide. We continued with multimodal analgesia consisting of metamizole 500 mg/8h orally, diclofenac 100 mg/24 h orally and paracetamol 1g/8h intravenously if needed. Two of the patients did not receive any opioid interventions. The patients did not mark any sickness or vomiting in the first 48 h postoperatively. The most concerning factor of the ES catheter block for now is its cost, which might be several times higher than the cost of opioid analgesia.

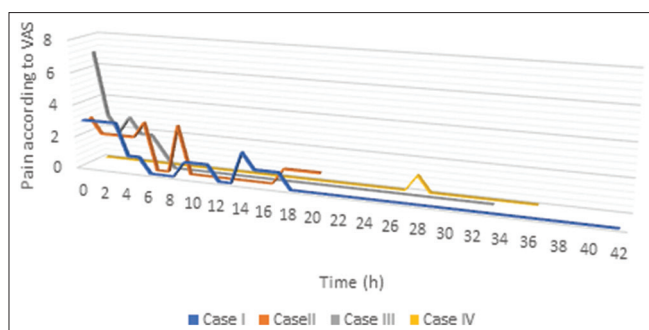


Figure 2: Postoperative pain in resting state according to VAS until the ES catheter removal

We decided for a combination of continuous infusion of local anesthetic with intermittent boluses. The supremacy of each of the administration regimes is yet unclear.^[9] A pooled review of all publications, concerning ES blocks until 2018, reported 80% single shot techniques, followed by intermittent boluses (12%) and continuous infusions (8%).^[10] Further investigations are needed before a perfect administration regime is determined.

CONCLUSION

As noted in our previously described cases, the continuous ES plane block is an efficient method of postoperative analgesia and goes with accordance to Enhanced Recovery After Surgery Guidelines for recovery after lung surgery.^[11] Further studies are needed to scientifically confirm efficiency and cost-benefit of the method.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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